Smolt Migration 2006

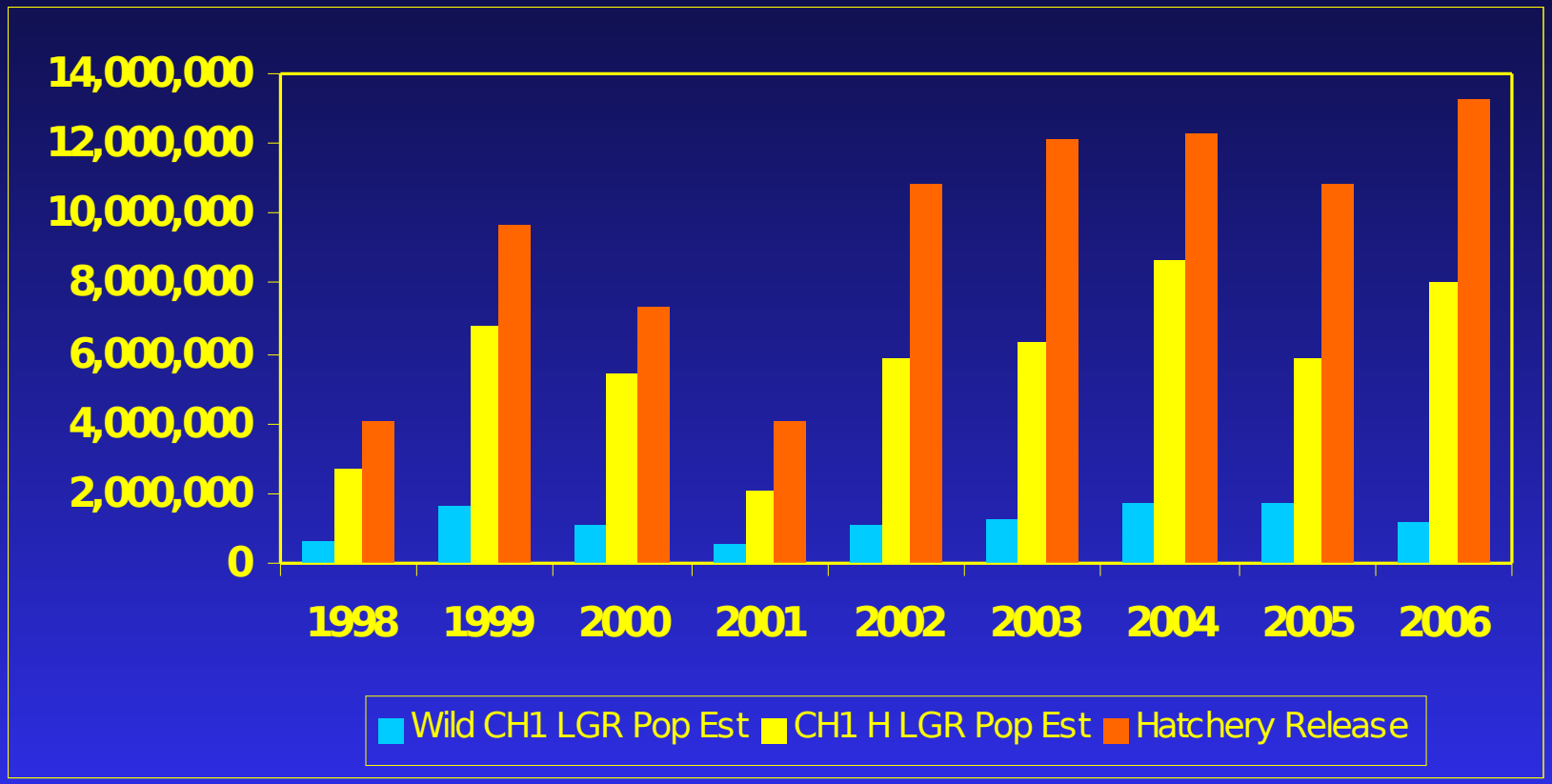
(preliminary results)

Fish Passage Center

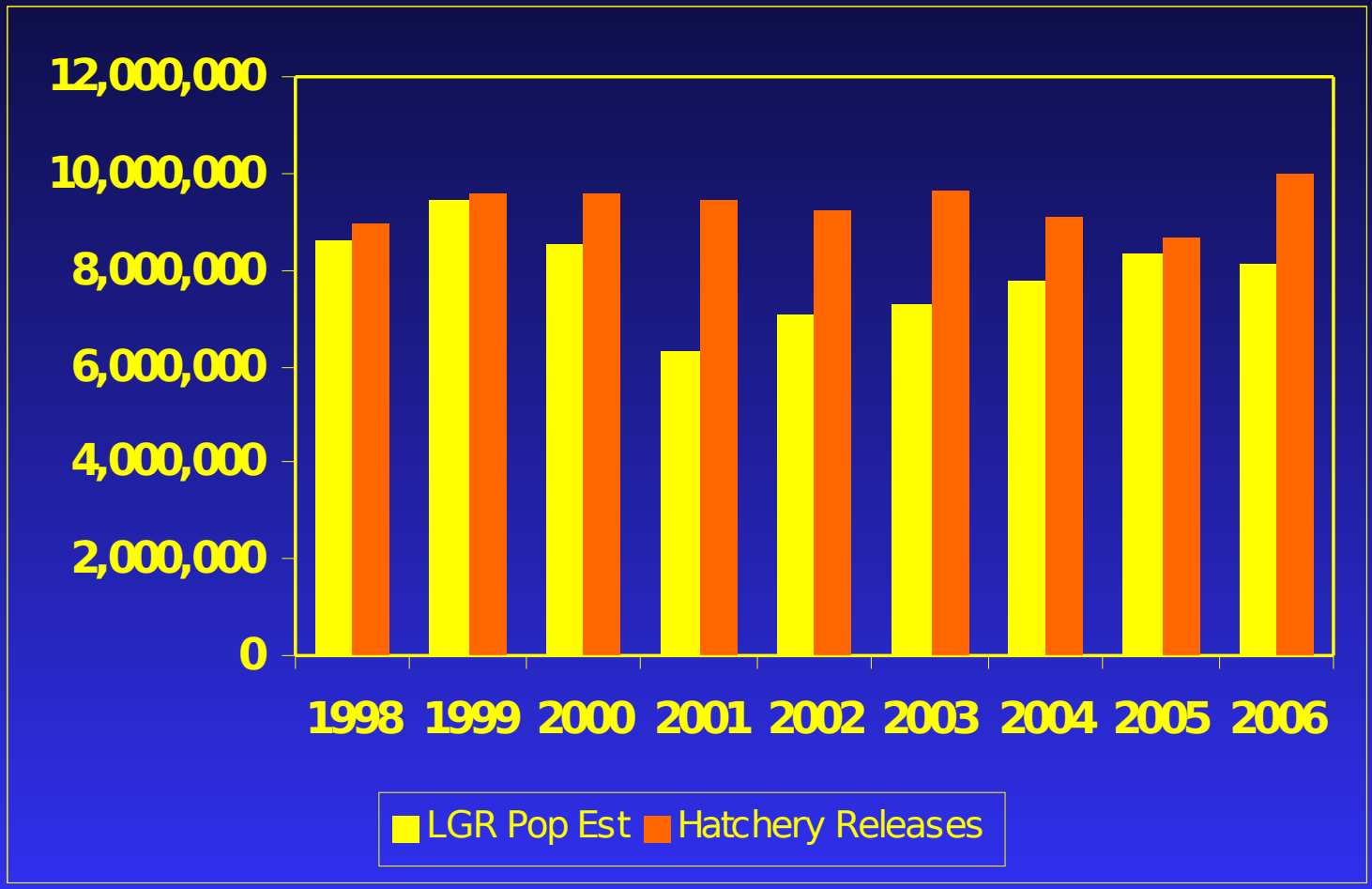
Review of 2006 Smolt Migration

- Run Size
- Timing
- Spread-the-risk delayed transport
- Subyearling survival & summer spill

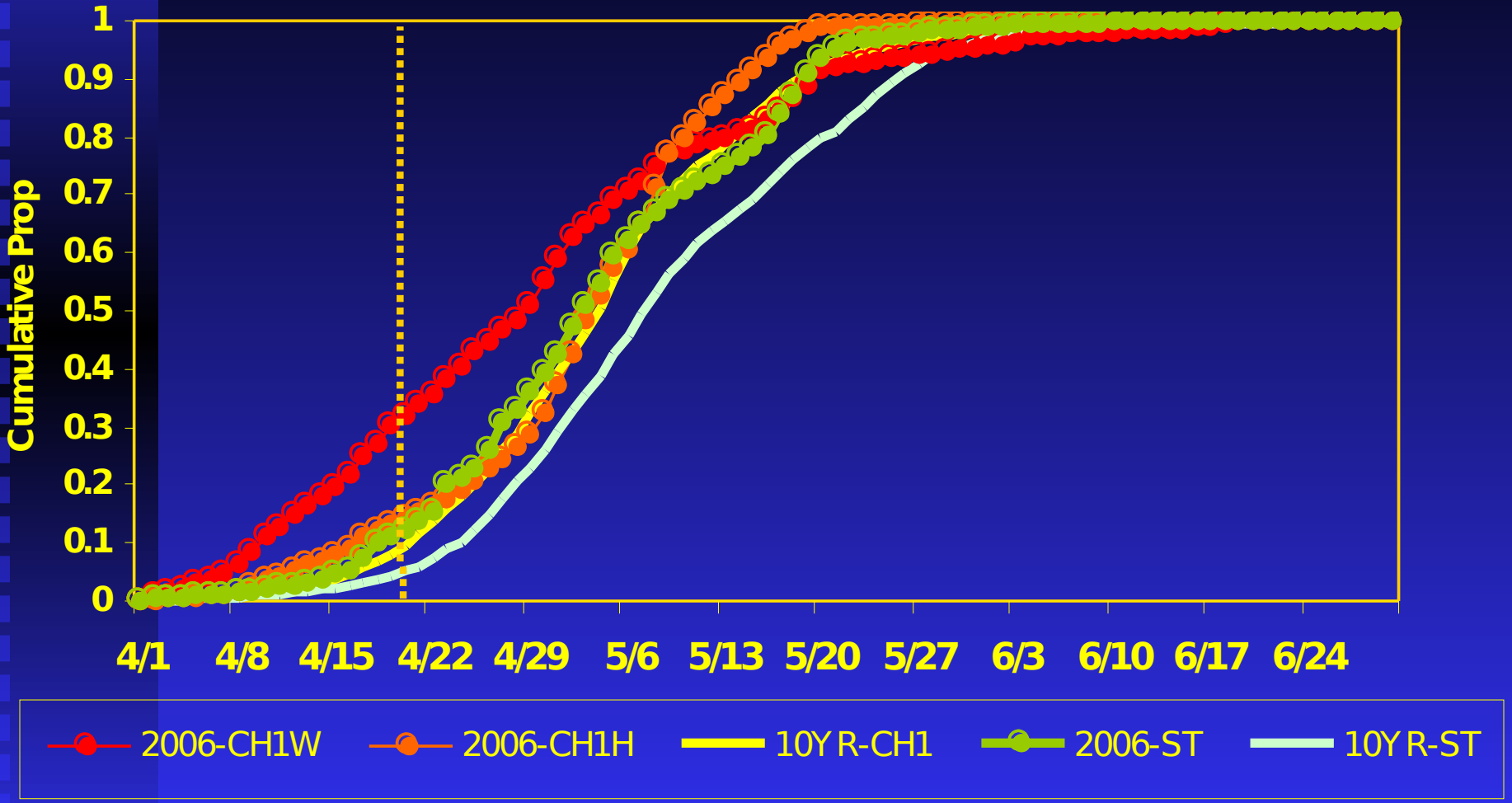
Yearling Chinook Population Index at Lower Granite and Hatchery Releases



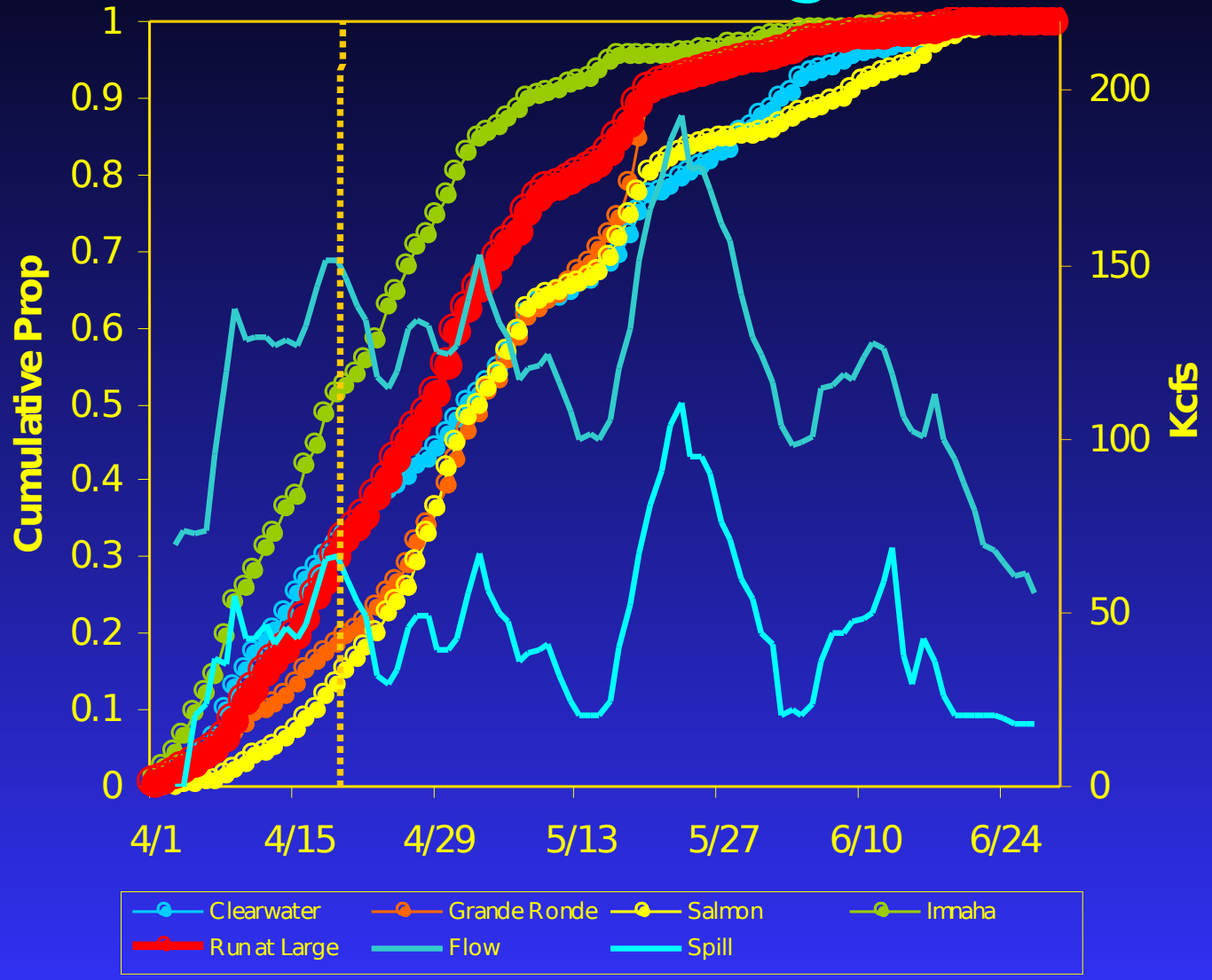
Combined H&W Steelhead Population at Lower Granite and Hatchery Releases



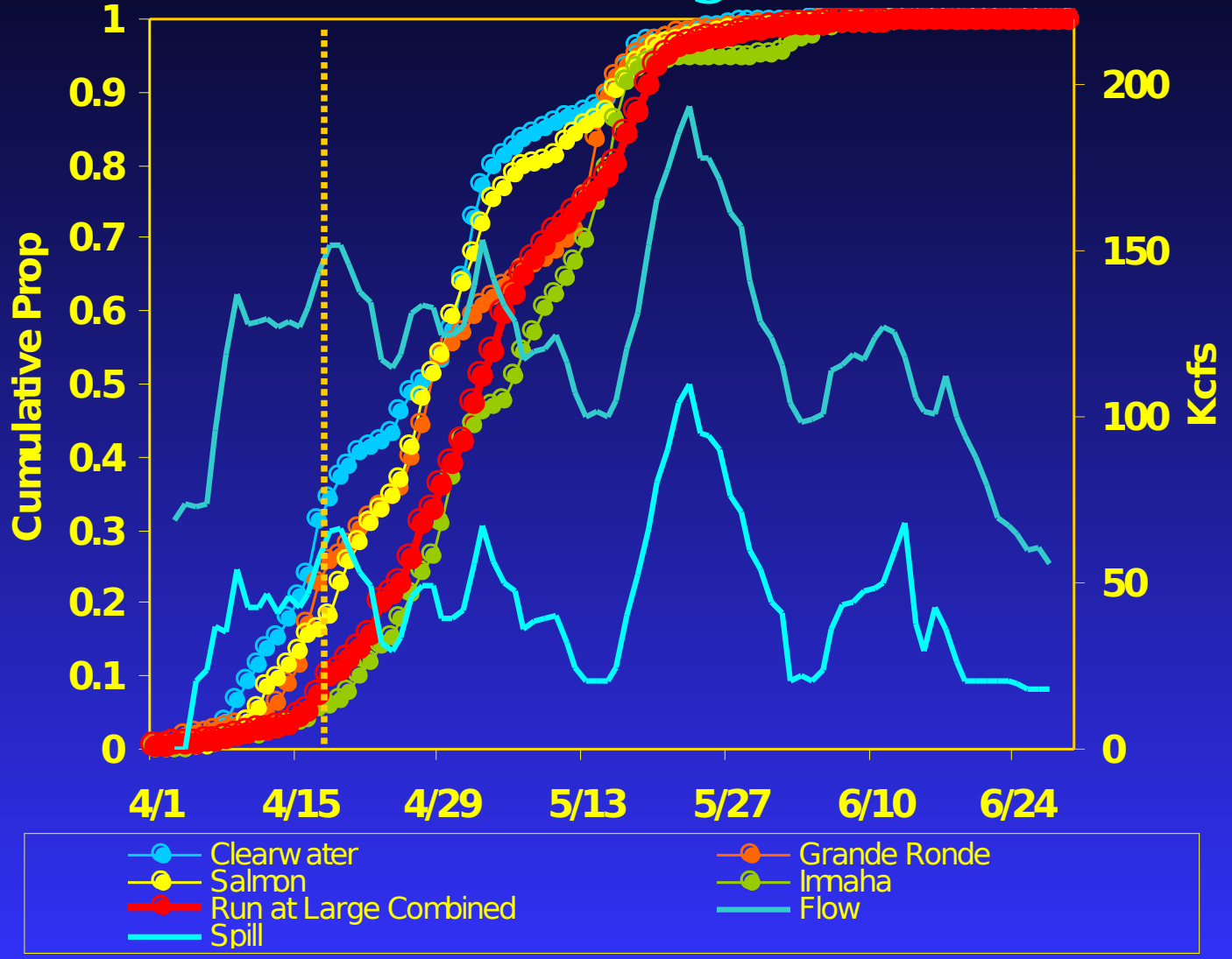
Timing of Spring Migrants at Lower Granite



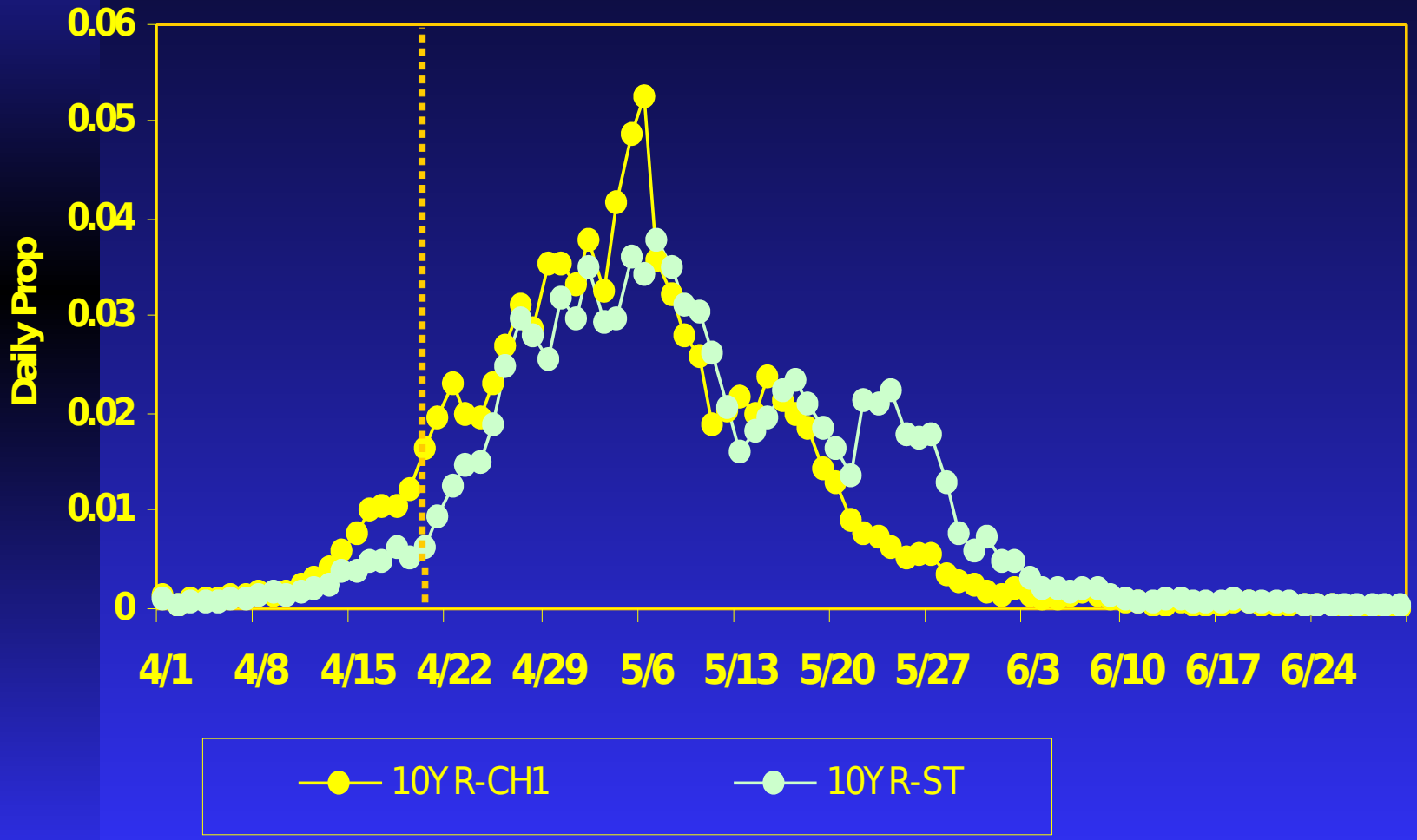
Wild PIT tagged rearing Chinook Timing at LGR and wild run at large



Wild PIT-tag Steelhead Timing at Lower Granite and Combined run at large



Run at Large ST & CH 10Yr Avg Timing at LGR



Summary of 2006 Transport

Species	Proportion Passing During Transport	Estimated Collection Efficiency				Proportion of Pop transport P(T)
		LGR	LGS	LMN	MCN	
Wild Steelhead	**0.87[a]**	**0.37**	**0.66**	**0.61**	**na**	**0.79**
Hatchery Steelhead	**0.87[a]**	**0.35**	**0.62**	**0.53**	**na**	**0.76**
Wild Sp/Su Chinook	**0.68**	**0.32**	**0.58**	**0.5**	**na**	**0.58**
Hatch Sp/Su Chinook	**0.86**	**0.24**	**0.42**	**0.35**	**na**	**0.61**
Wild fall Chinook (subs)	**(1)**	**0.16**	**0.3**	**0.12**	**0.21**	**0.59**
Hatch fall	**1**	**0.1**	**0.3**	**0.1**	**0.17**	**0.61**

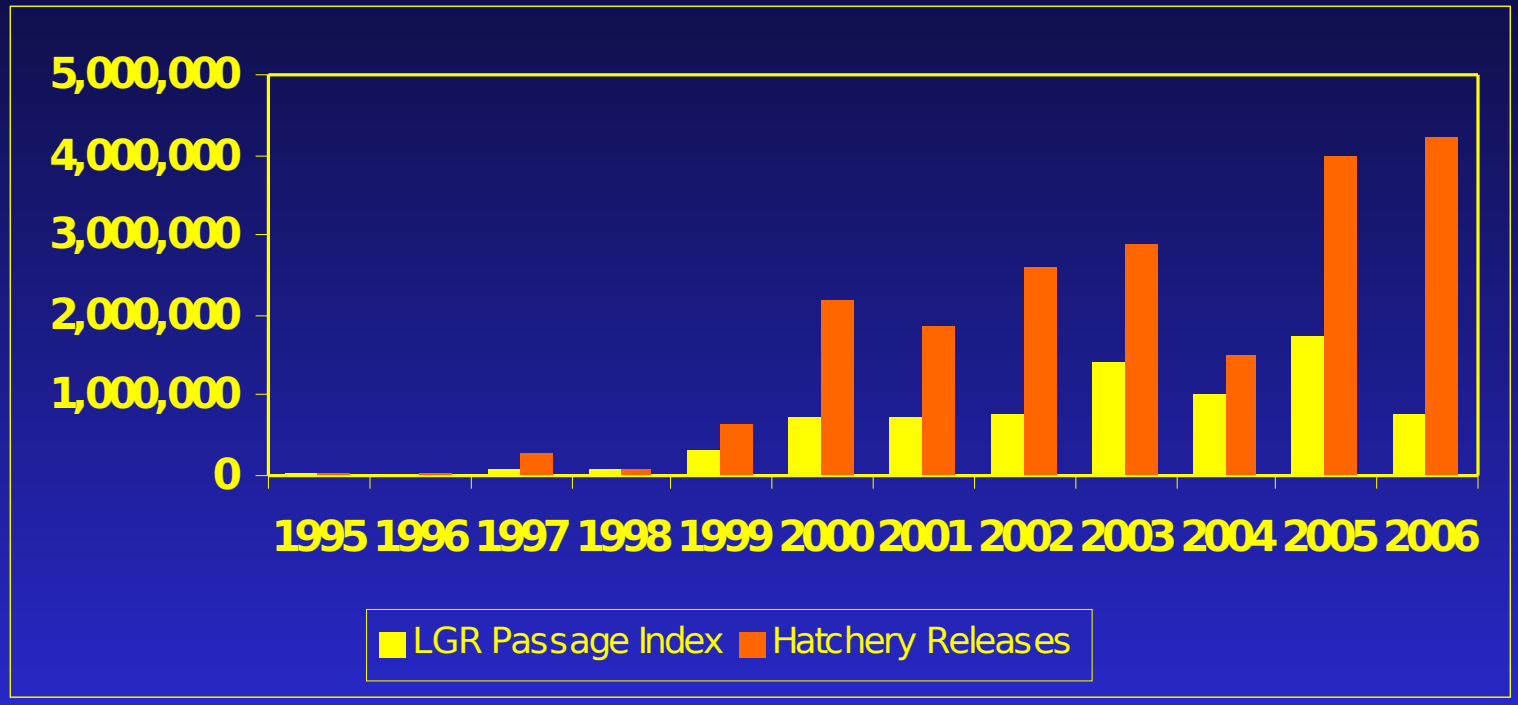
$$P(T) = [CE_{lgr} + CE_{lgs}*(1-CE_{lgr}) + CE_{lmn}*(1-CE_{lgs})(1-CE_{lgr})]*Prop(Pop)$$

Other ways to measure transport proportion

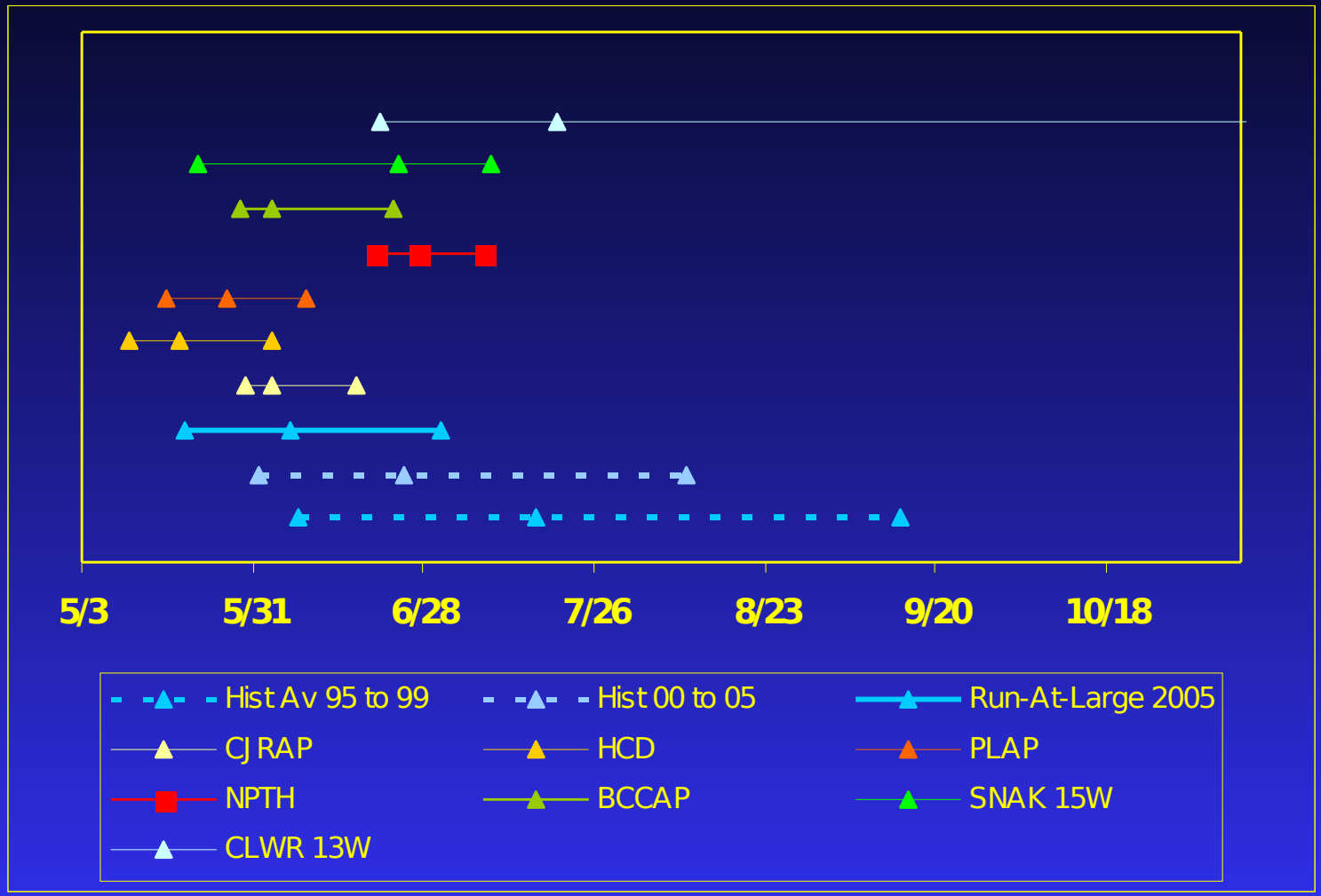
Species	Prop Pop Passing During Transport Prop(Pop)	Overall Prob of transport P(T)	Prob of transpt (Destin-ed) P(t)	Prob of passing uncollected P(Unc)	In-River Prop Below LMN P(InRiv)	In-Trans Prop Below LMN P(Tran)	InRiver Prop Bypassed P(Byp) (pct of InRiv)
Wild Steelhead	**0.87[a]**	**0.79**	**0.92**	**0.08**	**0.17**	**0.77**	**0.12(69%)**
Hatchery Steelhead	**0.87[a]**	**0.76**	**0.88**	**0.12**	**0.20**	**0.74**	**0.11(58%)**
Wild Sp/Su Chinook	**0.68**	**0.58**	**0.86**	**0.14**	**0.32**	**0.55**	**0.27(85%)**
Hatch Sp/Su Chinook	**0.86**	**0.61**	**0.71**	**0.29**	**0.28**	**0.57**	**0.09(32%)**
Wild fall Chinook (s)	**(1)**	**0.59**	**0.59**	**0.41**			
Hatch fall Chinook (s)	**1**	**0.61**	**0.61**	**0.39**			

- $P(T) = P(t)* Prop(Pop)$
- $P(t) = CE_{lgr} + S_{lgs}*(1-CE_{lgr}) + S_{lmn}*(1-CE_{lgs})(1-CE_{lgr})$
- $P(Unc) = (1-CE_{lgr})(1-CE_{lgs})(1-CE_{lmn})$
- $P(InRiv) = Prop(Pop)*[P(Unc)*S_{lgs}*S_{lmn}] + (1-Prop(pop))*S_{lgs}*S_{lmn}$
- $P(Tran) = Prop(Pop)*[CE_{lgr} + CE_{lgs}*(1-CE_{lgr})*S_{lgs} + CE_{lmn}*(1-CE_{lgs})(1-CE_{lgr})*S_{lgs}*S_{lmn}]$
- $P(Byp) = [CE_{lgr} + S_{lgs}*CE_{lgs}*(1-CE_{lgr}) + S_{lmn}*CE_{lmn}*(1-CE_{lgs})(1-CE_{lgr})]*(1- Prop(Pop))$

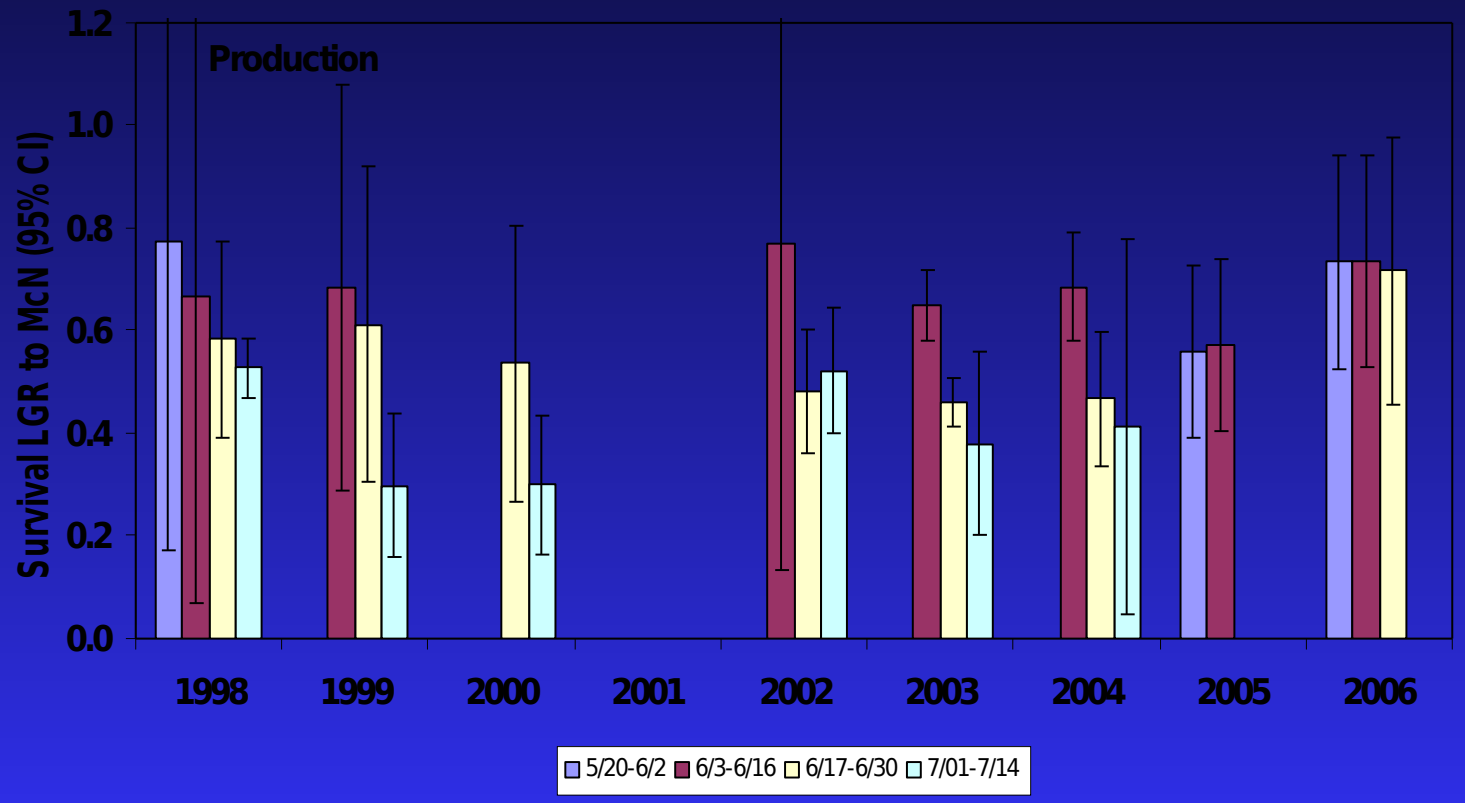
Hatchery/Supplementation Releases of Subyearling Chinook above LGR



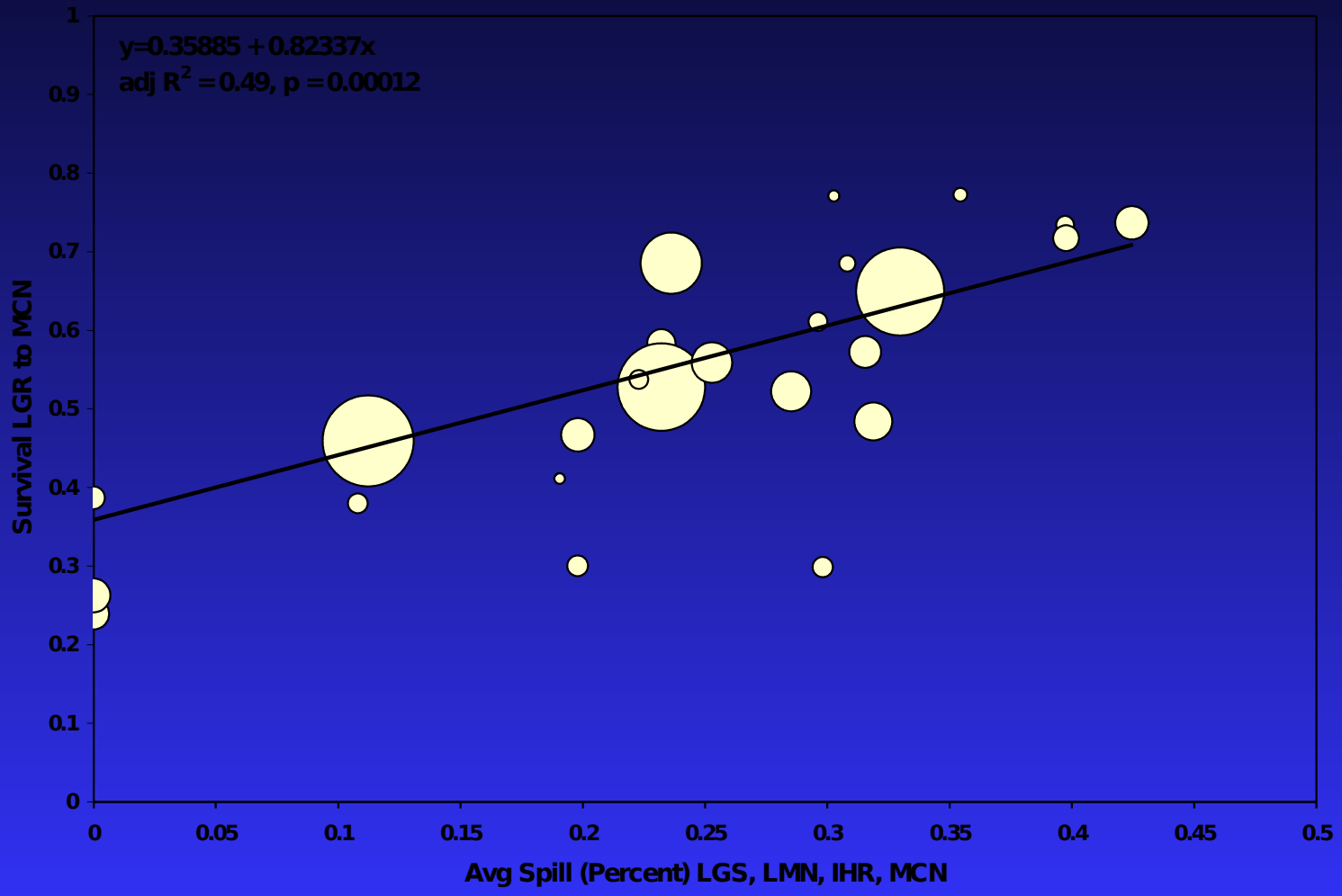
Subyearling Chinook Timing at LGR



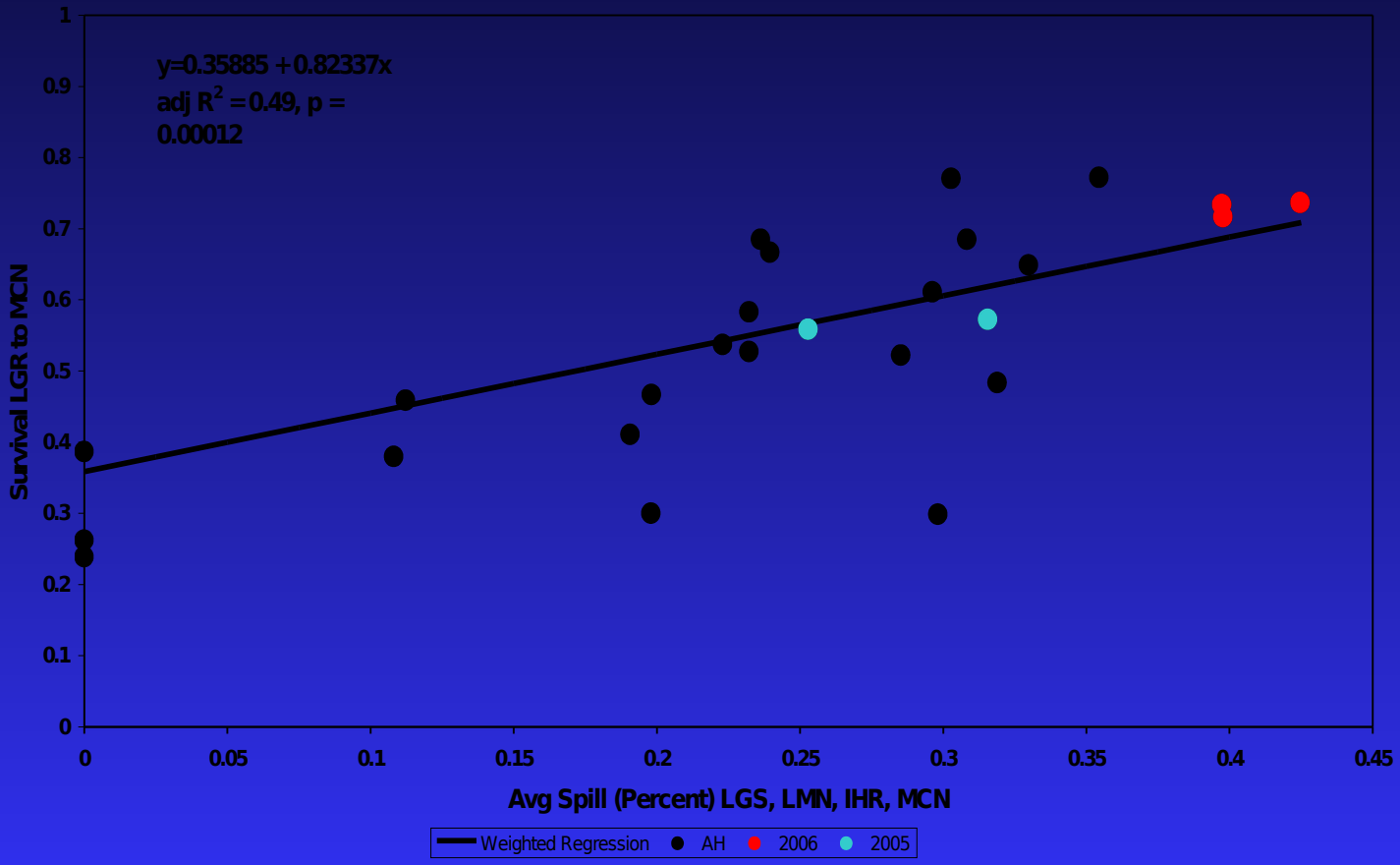
Survival for Production Subyearling Chinook LGR to McN 1998 to 2006 with 95% CI's



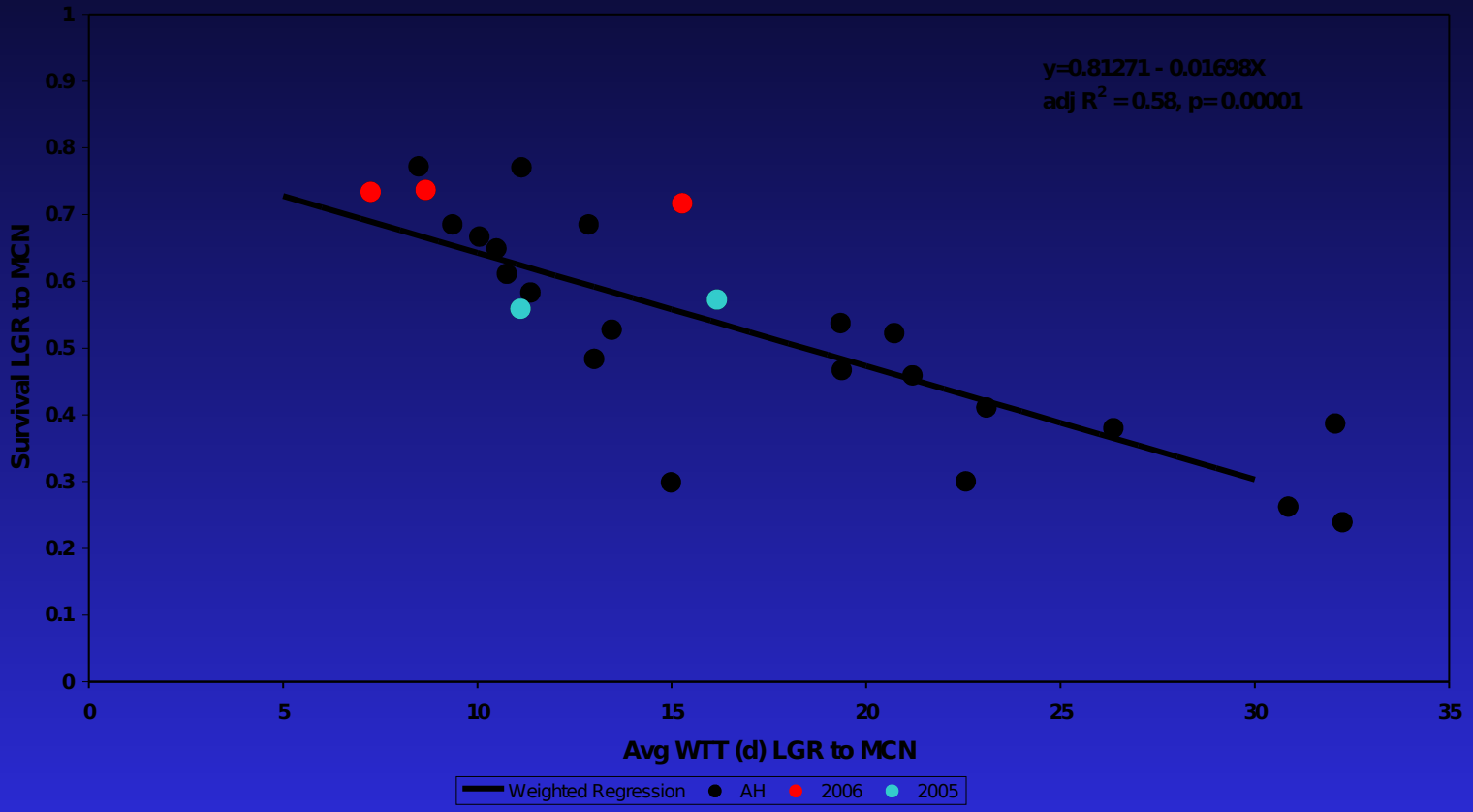
Weighted Regression example



AH Subyearling Chinook Survival vs Avg Spill Pct LGS, LMN, IHR, McN



AH Subyearling Chinook Survival vs sum WTT LGS, LMN, IHR, McN



AH Subyearling Chinook Survival vs Avg Temp LGS, LMN, IHR, McN